

[Name of Document] WHAT IS CLAIMED IS:

1. A fuel cell optimum operating point tracking system used in a power source device powered by a fuel cell, configured so as to improve the responsiveness thereof by monitoring the power state while varying the output voltage of said fuel cell, and by allowing said fuel cell to start operation at an input voltage corresponded to a maximum power point thereof, comprising:
a fuel cell maximum power search function; and a fuel cell optimum operating point tracking function capable of tracking an optimum operating point through maximum power monitoring, by allowing said fuel cell maximum power search function to operate so as to monitor the power state to thereby keep the power source operation constant at a stable condition, and additionally giving a minimal voltage change at around the current operating voltage value.
2. The fuel cell optimum operating point tracking system as claimed in Claim 1, wherein said fuel cell maximum power search function comprises a fuel cell output voltage variation command unit capable of varying the output voltage of said fuel cell upon activation thereof up to as high as the maximum voltage for the maximum power point tracking control.
3. The fuel cell optimum operating point tracking system as claimed in Claim 1, wherein said fuel cell maximum power search function comprises a fuel cell output power measuring unit capable of measuring the power state of said fuel cell by varying the output voltage upon activation thereof.
4. The fuel cell optimum operating point tracking system as claimed in Claim 1, wherein said fuel cell maximum power search function comprises a fuel cell maximum power point judging-and-storing unit capable of monitoring the output power of said fuel cell upon activation thereof, and of judging the maximum power point of the output voltage of said fuel cell.

5. The fuel cell optimum operating point tracking system as claimed in Claim 4, wherein said fuel cell maximum power point judging-and-storing unit is configured so as to judge a voltage under which the command voltage becomes maximum within a range of the successive detection as the maximum power point, when the maximum power point is successively detected despite said command voltage is varied.
6. The fuel cell optimum operating point tracking system as claimed in Claim 1, wherein said fuel cell maximum power search function comprises a timer having a specified voltage refreshing interval set therein, configured so as to measure the power state by clearing, after the elapse of said specified voltage refreshing interval, the stored values of the fuel cell output voltage maximum point and the output voltage corresponded thereto upon activation of said fuel cell, and by varying the output voltage of said fuel cell up to as high as the maximum voltage for the maximum power point tracking control.
7. The fuel cell optimum operating point tracking system as claimed in Claim 1, wherein said fuel cell maximum power search function comprises a power source activation detecting unit capable of measuring the power state by varying the output voltage of the fuel cell upon activation thereof up to as high as the maximum voltage for the maximum power point tracking control.
8. The fuel cell optimum operating point tracking system as claimed in Claim 1, wherein said fuel cell maximum power search function comprises an optimum operating point variation command unit capable of tracking the optimum operation point, by monitoring the power state at the fuel cell output power maximum point upon activation of said fuel cell, and by effecting the maximum power monitoring through additionally giving a minimal voltage change at around the current operating voltage value.
9. The fuel cell optimum operating point tracking system as claimed in Claim 1, wherein said

fuel cell optimum operating point tracking function comprises a fuel cell output voltage variation command unit capable of varying the output voltage upon being activated by said fuel cell maximum power search function up to as high as the maximum voltage for the maximum power point tracking control.

10. The fuel cell optimum operating point tracking system as claimed in Claim 1, wherein said fuel cell optimum operating point tracking function comprises a fuel cell output power measuring unit capable of measuring the power state by varying the output voltage upon being activated by said fuel cell maximum power search function.
11. The fuel cell optimum operating point tracking system as claimed in Claim 1, wherein said fuel cell optimum operating point tracking function comprises a fuel cell maximum power point judging-and-storing unit capable of monitoring the output voltage upon being activated by said fuel cell maximum power search function, and judging the maximum power point of the output voltage of the fuel cell.
12. The fuel cell optimum operating point tracking system as claimed in Claim 11, wherein said fuel cell maximum power point judging-and-storing unit is configured so as to judge a voltage under which the command voltage becomes maximum within a range of the successive detection as the maximum power point, when the maximum power point is successively detected despite said command voltage is varied.
13. The fuel cell optimum operating point tracking system as claimed in Claim 1, wherein said fuel cell optimum operating point tracking function comprises a timer unit having a specified voltage refreshing interval set therein, configured so as to measure the power state by clearing, after every elapse of said specified voltage refreshing interval, the stored values of the fuel cell output voltage maximum point and the output voltage corresponded thereto upon being activated by said fuel cell maximum power search function, and by varying the output voltage of said fuel cell up to as high as the maximum voltage for the

maximum power point tracking control.

14. The fuel cell optimum operating point tracking system as claimed in Claim 1, wherein said fuel cell optimum operating point tracking function comprises an optimum operating point variation command unit capable of tracking the optimum operating point, by monitoring the power state at the fuel cell output power maximum point upon activation with the aid of said fuel cell maximum power search function to thereby keep the power source operation constant at a stable condition, and by effecting the maximum power monitoring through additionally giving a minimal voltage change at around the current operating voltage value.
15. The fuel cell optimum operating point tracking system as claimed in Claim 1, further comprising an intermittent operation preventive function capable of monitoring, during the operation of said power source device, the output voltage of the fuel cell, and of outputting an output interruption voltage, upon lowering of the fuel cell output voltage to as low as the fuel cell output interruption voltage or below, to thereby turn said power source device into interruption state.
16. The fuel cell optimum operating point tracking system as claimed in Claim 15, wherein said intermittent operation preventive function comprises a fuel cell output voltage measuring unit capable of measuring the fuel cell output voltage during operation of said fuel cell optimum operating point tracking function.
17. The fuel cell optimum operating point tracking system as claimed in Claim 15, wherein said intermittent operation preventive function comprises a fuel cell output interruption judging unit capable of judging whether output of the fuel cell should be interrupted or not, when the fuel cell output voltage drops to the fuel cell output interruption voltage or below during operation of said fuel cell optimum operating point tracking function.

18. The fuel cell optimum operating point tracking system as claimed in Claim 15, wherein said intermittent operation preventive function comprises a timer unit capable of controlling the intermittent operation when output of the fuel cell is interrupted during operation of said fuel cell optimum operating point tracking function.
19. The fuel cell optimum operating point tracking system as claimed in Claim 18, wherein said timer unit is configured so as to interrupt said fuel cell, to set a restart wait time, to measure the output voltage of said fuel cell after the elapse of the restart wait time, and to output an operation output signal if the voltage reaches or exceeds the restart voltage to thereby activate said fuel cell.
20. The fuel cell optimum operating point tracking system as claimed in Claim 15, wherein said intermittent operation preventive function comprises a fuel cell output start judging unit capable of judging whether restart of the fuel cell interrupted during the operation of said fuel cell optimum operating point tracking function is allowable or not.
21. The fuel cell optimum operating point tracking system as claimed in Claim 1, further comprising a fuel cell optimum operating point tracking and retaining function capable of widening the specified voltage refreshing interval, when variation in the output voltage of said fuel cell falls below the amount of variation of set voltage within a predetermined time period.
22. The fuel cell optimum operating point tracking system as claimed in Claim 21, wherein said fuel cell optimum operating point tracking and retaining function comprises a fuel cell optimum operating point tracking unit having said fuel cell maximum power search function and said fuel cell optimum operating point tracking function.
23. The fuel cell optimum operating point tracking system as claimed in Claim 21, wherein said fuel cell optimum operating point tracking and retaining function comprises a fuel cell

output voltage control value variation judging unit capable of judging whether the output voltage variation of said fuel cell falls below, or exceeding the amount of variation of set voltage within a predetermined time period.

24. The fuel cell optimum operating point tracking system as claimed in Claim 21, wherein said fuel cell optimum operating point tracking and retaining function comprises a timer unit capable of operating so as to activate said fuel cell optimum operating point tracking unit, by widening the specified voltage refreshing interval, if the output voltage variation of said fuel cell falls below the amount of variation of set voltage within a predetermined time period, and by initializing said specified voltage refreshing interval, if the output voltage variation of said fuel cell exceeds the amount of variation of set voltage within a predetermined time period.
25. The fuel cell optimum operating point tracking system as claimed in Claim 21, wherein said fuel cell optimum operating point tracking and retaining function is configured so as to set a reference unit time, to count the number of times the output voltage variation of said fuel cell falls below said amount of variation of set voltage within every reference unit time, and to determine the state of fall below the amount of variation of set voltage within said predetermined time period by the fact that a specified number of count has successively been met.
26. The fuel cell optimum operating point tracking system as claimed in Claim 25, wherein said fuel cell optimum operating point tracking and retaining function comprises a counter capable of setting the reference unit time, and of counting the fact that the output voltage variation of said fuel cell falls below said amount of variation of set voltage within every reference unit time.
27. A power source unit comprising the fuel cell optimum operating point tracking system as claimed in Claim 1, said fuel cell optimum operating point tracking system being used in a

power source device powered by a fuel cell, configured so as to improve the responsiveness thereof by monitoring the power state while varying the output voltage of said fuel cell, and by allowing said fuel cell to start operation at an input voltage corresponded to a maximum power point thereof, comprising:

a fuel cell maximum power search function; and a fuel cell optimum operating point tracking function capable of tracking an optimum operating point through maximum power monitoring, by allowing said fuel cell maximum power search function to periodically operate so as to monitor the power state to thereby keep the power source operation constant at a stable condition, and additionally giving a minimal voltage change at around the current operating voltage value.